

# ATHLETE'S FOOT AWAY!

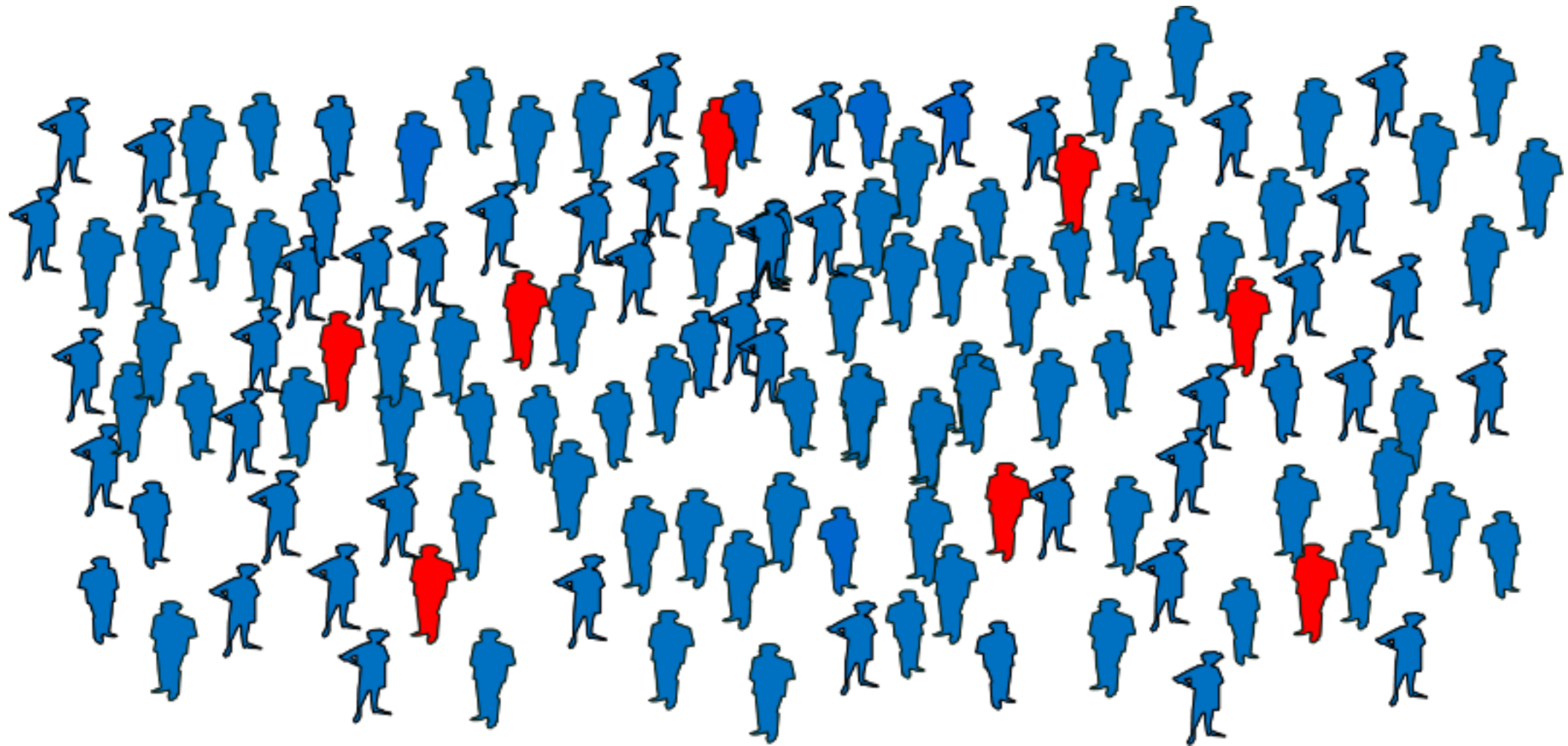
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*Design Project: Outlook on Bacterial Treatments*



# 15%-25%

1 in 6 - 1 in 4



1

?????

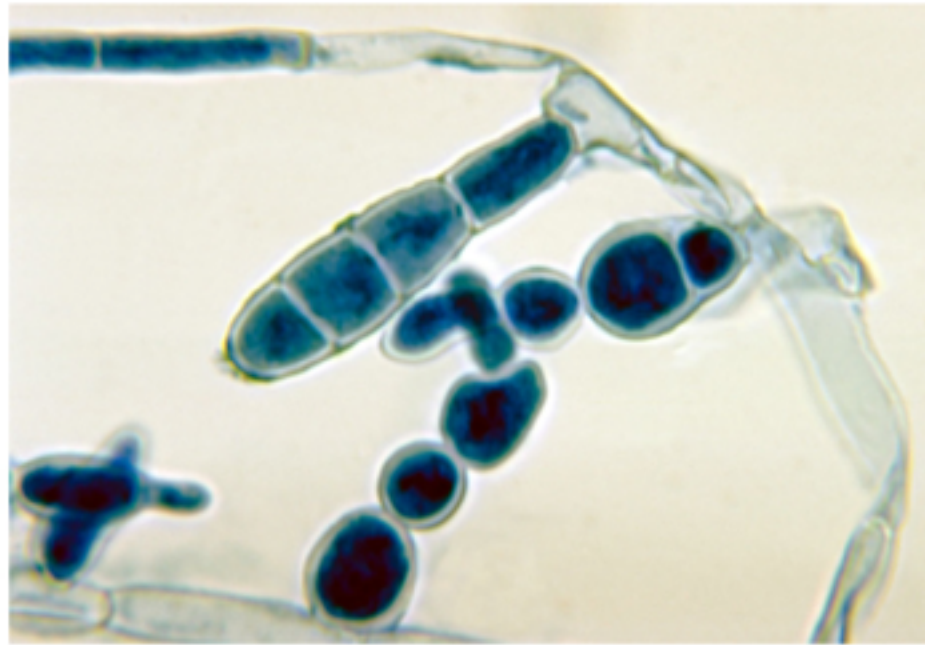
What is the problem?



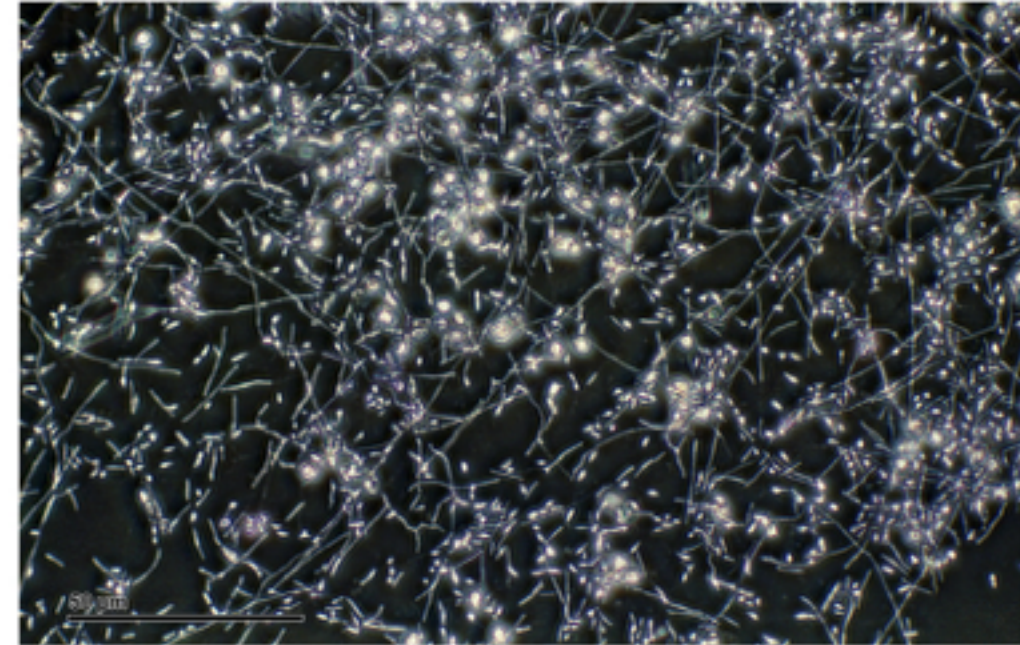
# DERMATOPHYTES



*Trichophyton rubrum*



*Epidermophyton floccosum*



*Trichophyton interdigitale*



# DERMATOPHYTOSIS

Contagious Skin Disease



**Tinea Pedis**



**Tinea Manuum**



**Tinea Unguium**



**Tinea Capitis**



**Tinea Faiei**



**Tinea Corporis**





red

cracked

slightly swollen

white

thickened

ring-shaped rash

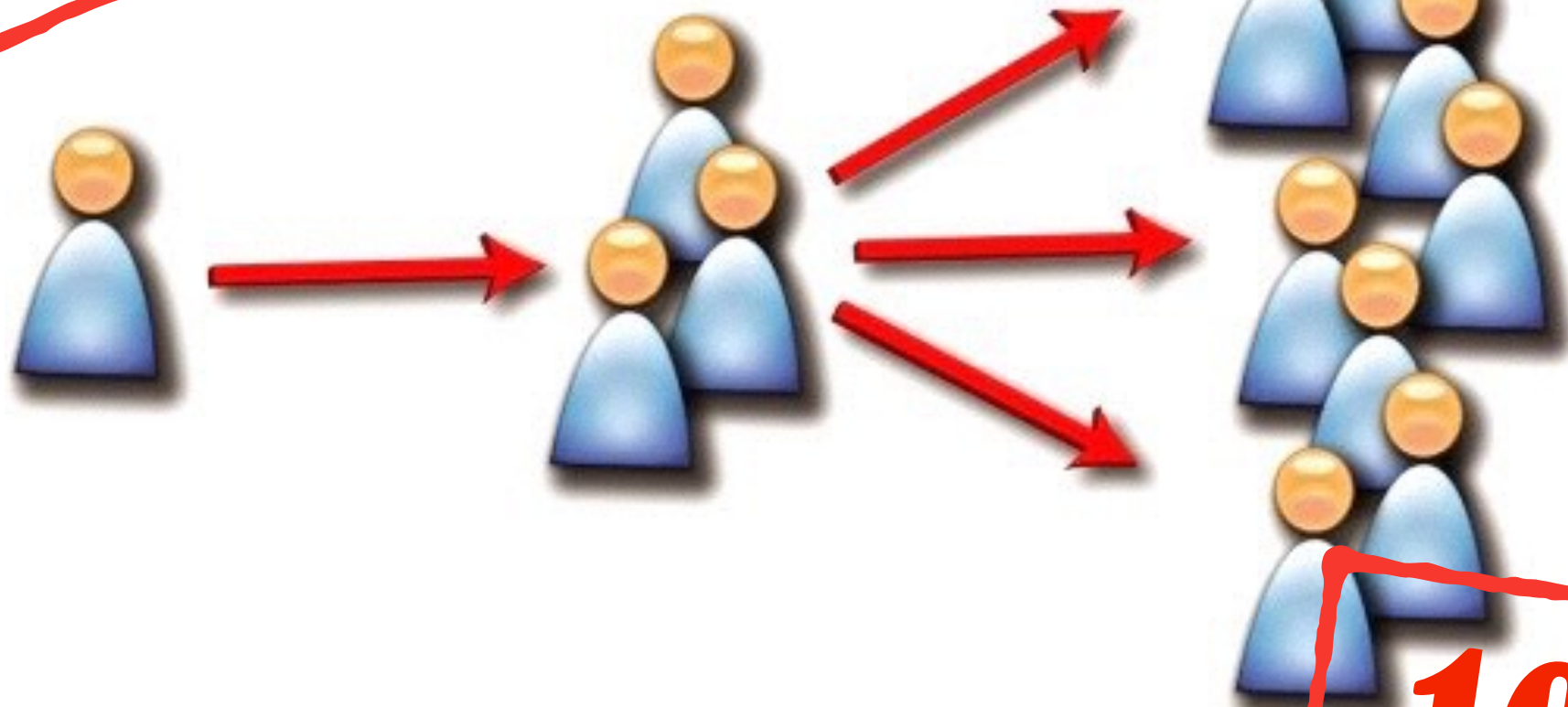
itchy

blister

inflammation

**15%-25%**

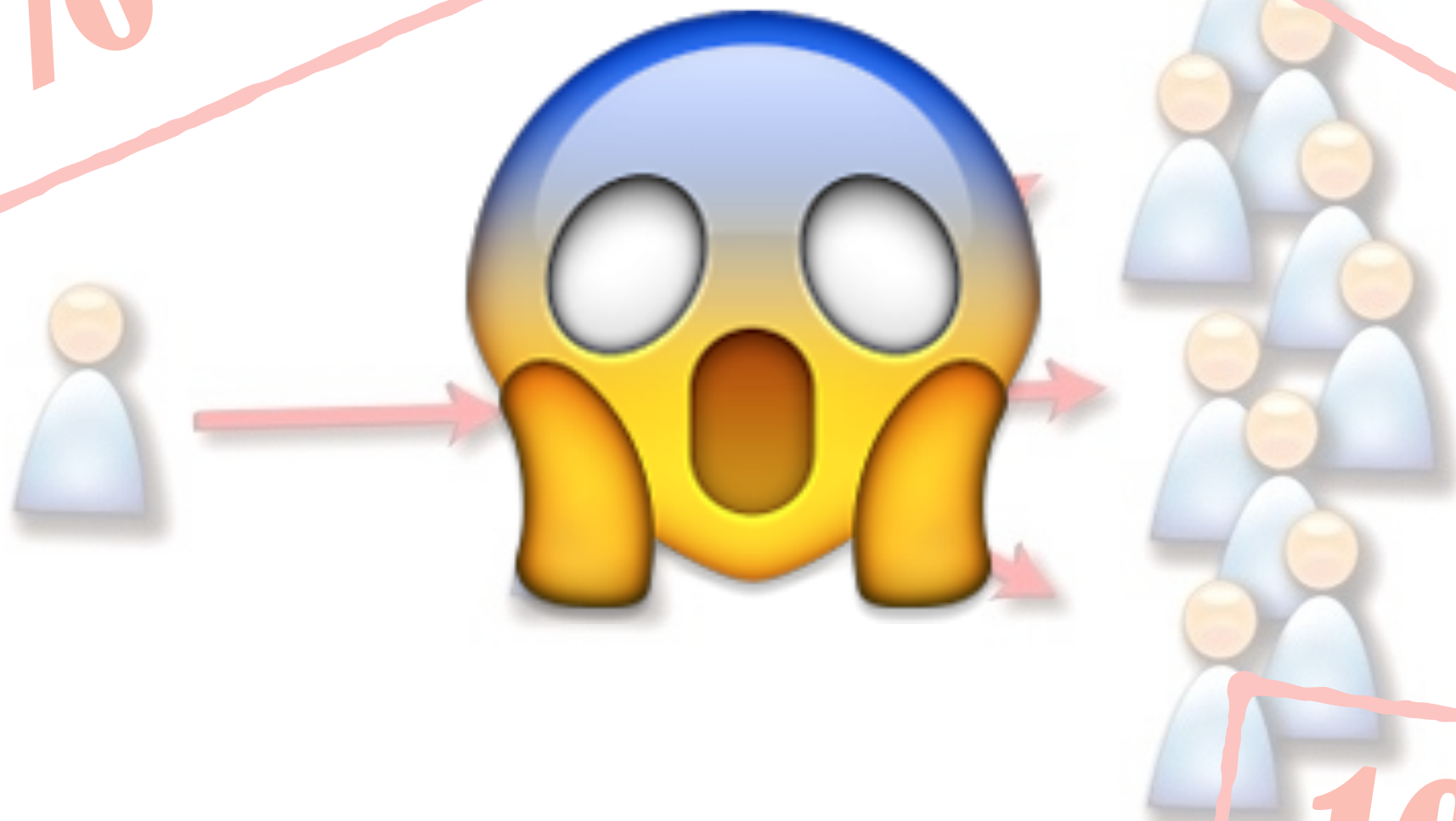
**INCREASING**



**10%**

15%-25%

INCREASING



10%



2

# Competing Technologies



## Topical Anti-fungal Cream

*miconazole nitrate, clotrimazole, tolnaftate, terbinafine hydrochloride, butenafine hydrochloride and undecylenic acid*



Topical Anti-fungal Cream

*miconazole nitrate, clotrimazole, tolnaftate, terbinafine hydrochloride, butenafine hydrochloride and undecylenic acid*

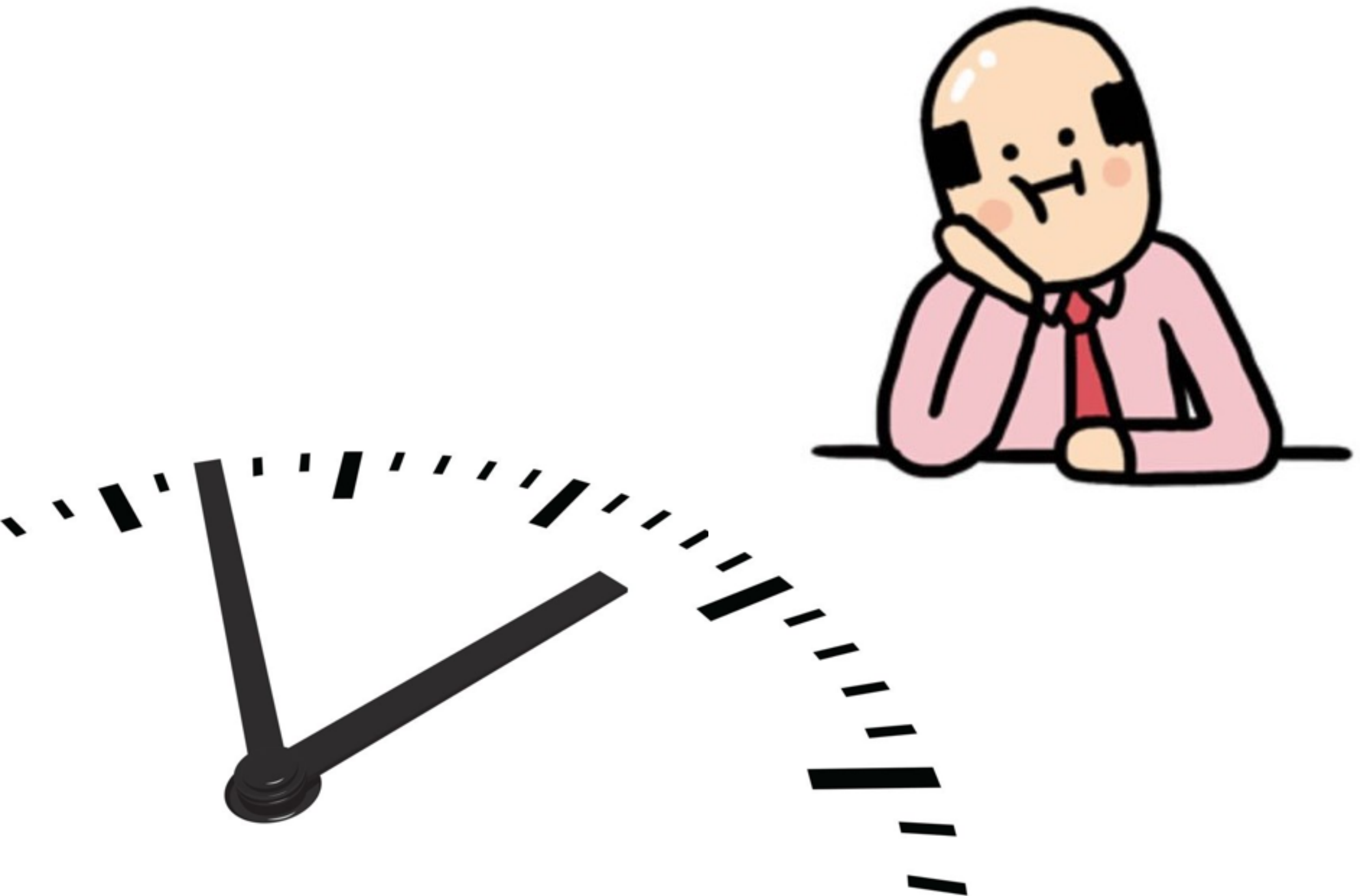


Oral Anti-fungal

*Terbinafine, fluconazole, and itraconazole*



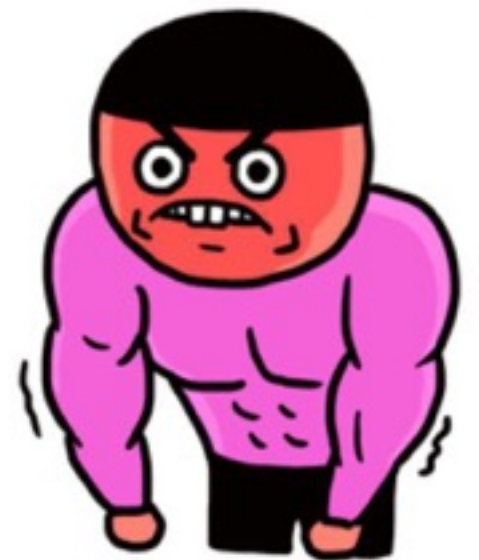
**BUT**



## Signs and Symptoms Clearance Rates for Tinea Pedis from Study by Kathleen Fritsch in 2004 (*Fritsch Kathleen, 2004*)

		<b>1-Week Treatment</b> EOT = Week 1 POC = Week 9	<b>4-Week Treatment</b> EOT = Week 4 POC = Week 6
		<i>Active</i>	<i>Active</i>
Erythema	EOT	<u>31/131 (24%)</u>	<u>90/202 (45%)</u>
	POC	77/131 (59%)	48/195 (25%)
Scaling	EOT	<u>2/131 (2%)</u>	<u>101/202 (50%)</u>
	POC	36/131 (27%)	48/195 (25%)
Pruritus	EOT	<u>60/131 (46%)</u>	<u>42/202 (21%)</u>
	POC	105/131 (80%)	28/195 (14%)





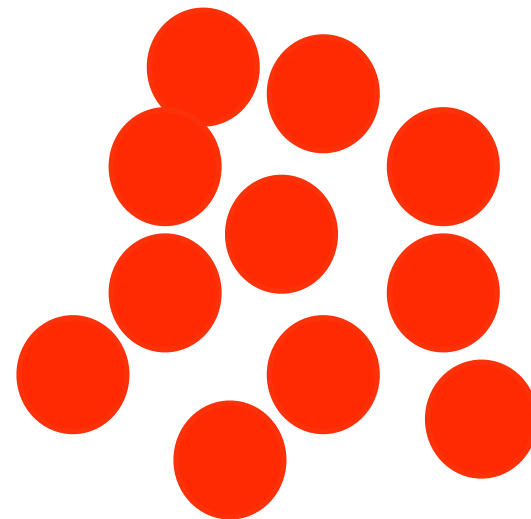
2



3



redness    tingling



rash



blister



feeling sick  
abdominal pain  
diarrhoea  
rash  
flatulence  
headache  
liver damage



3

# Design

Idea, Expected Results, Advantage, and Disadvantages

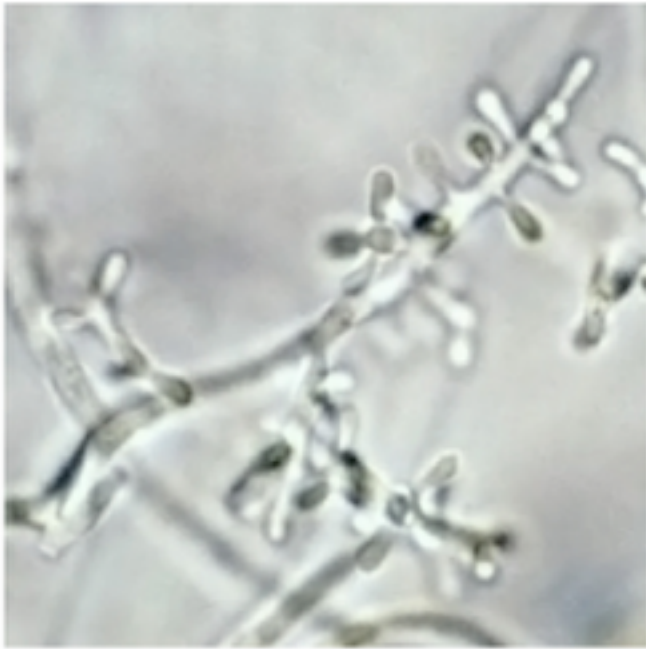


*Streptococcus pyogenes*

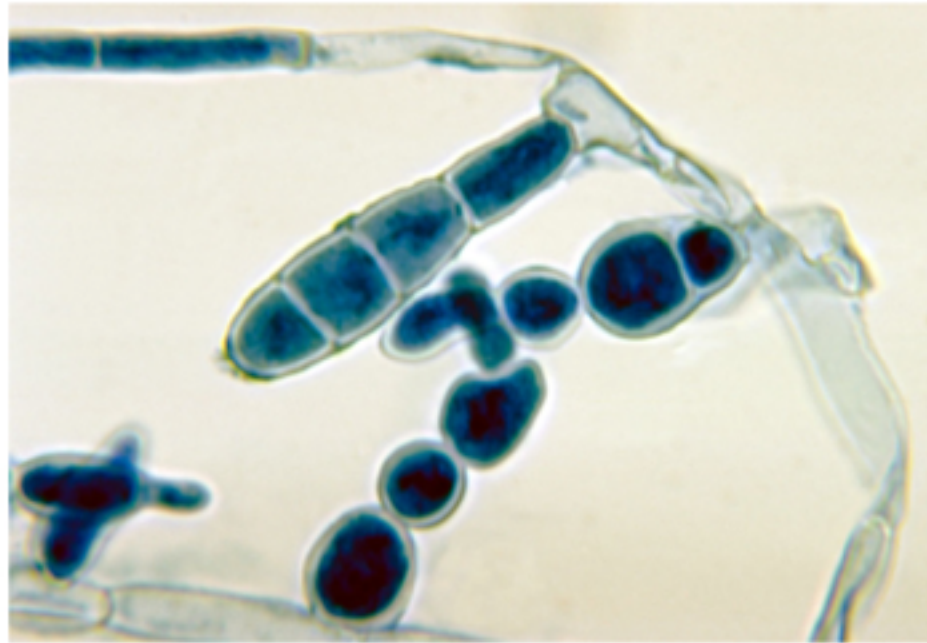




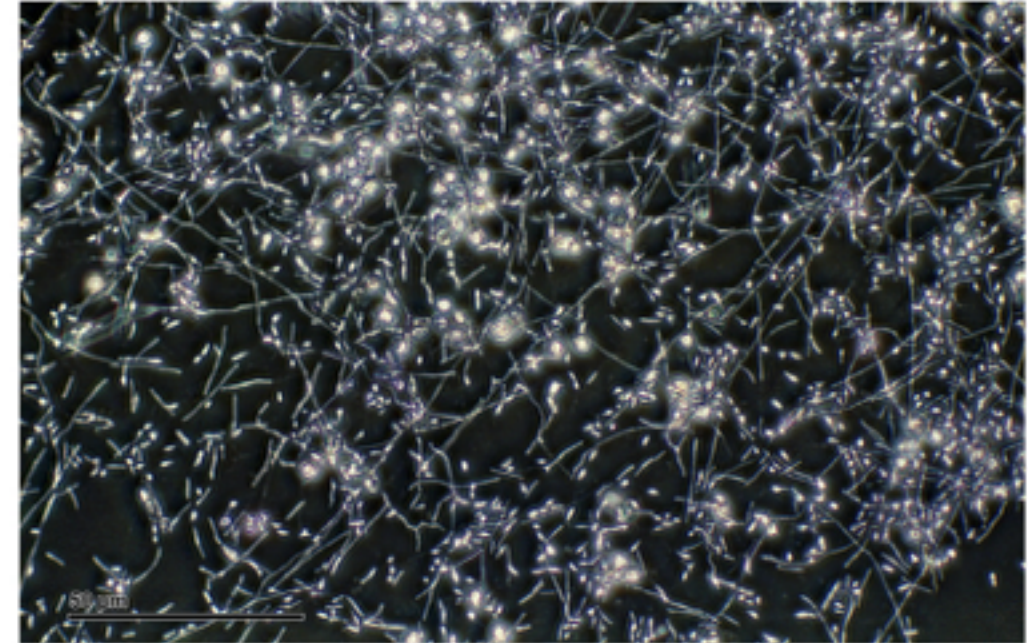
# DERMATOPHYTES



*Trichophyton rubrum*



*Epidermophyton floccosum*



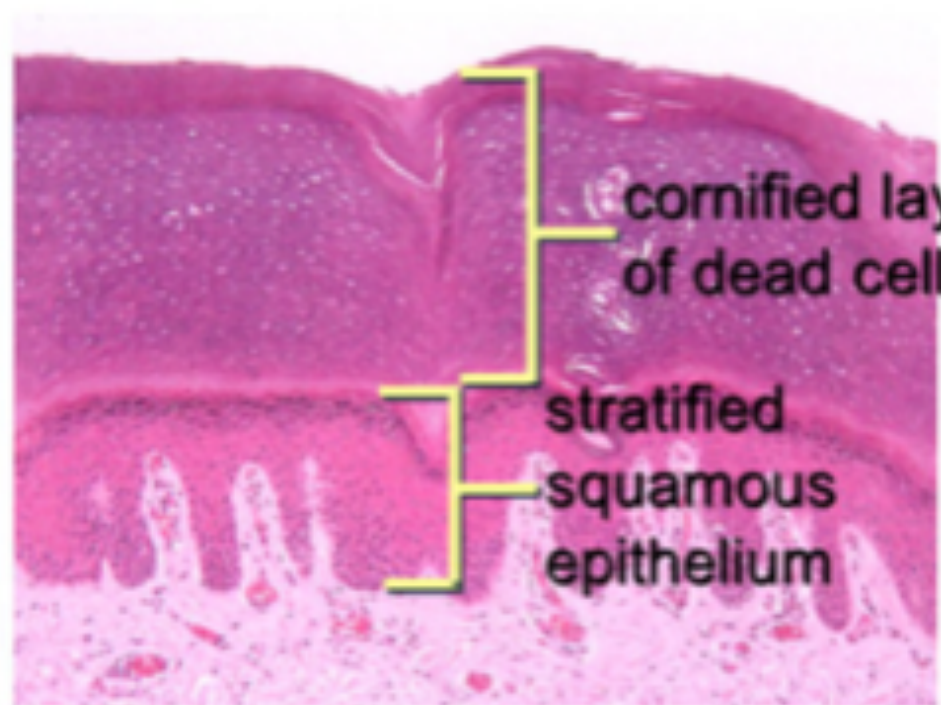
*Trichophyton interdigitale*



Deeper than cornified layer

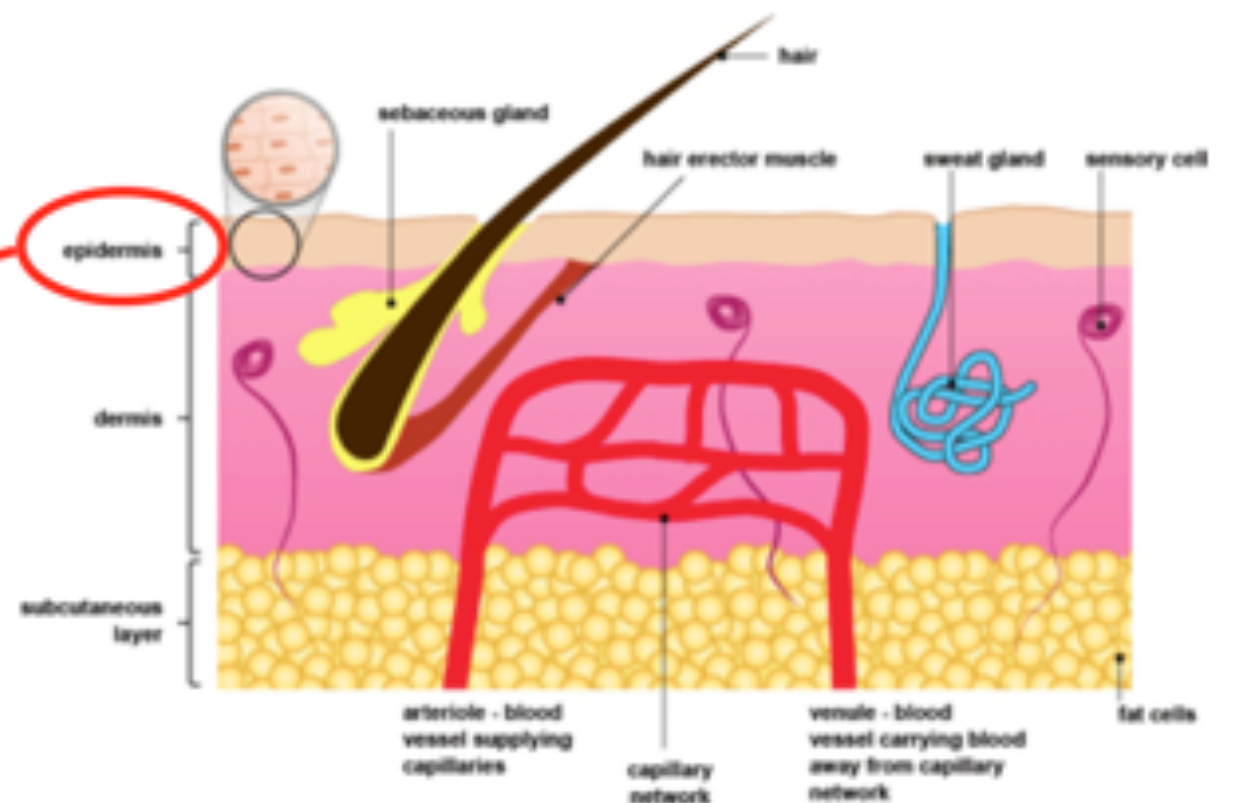


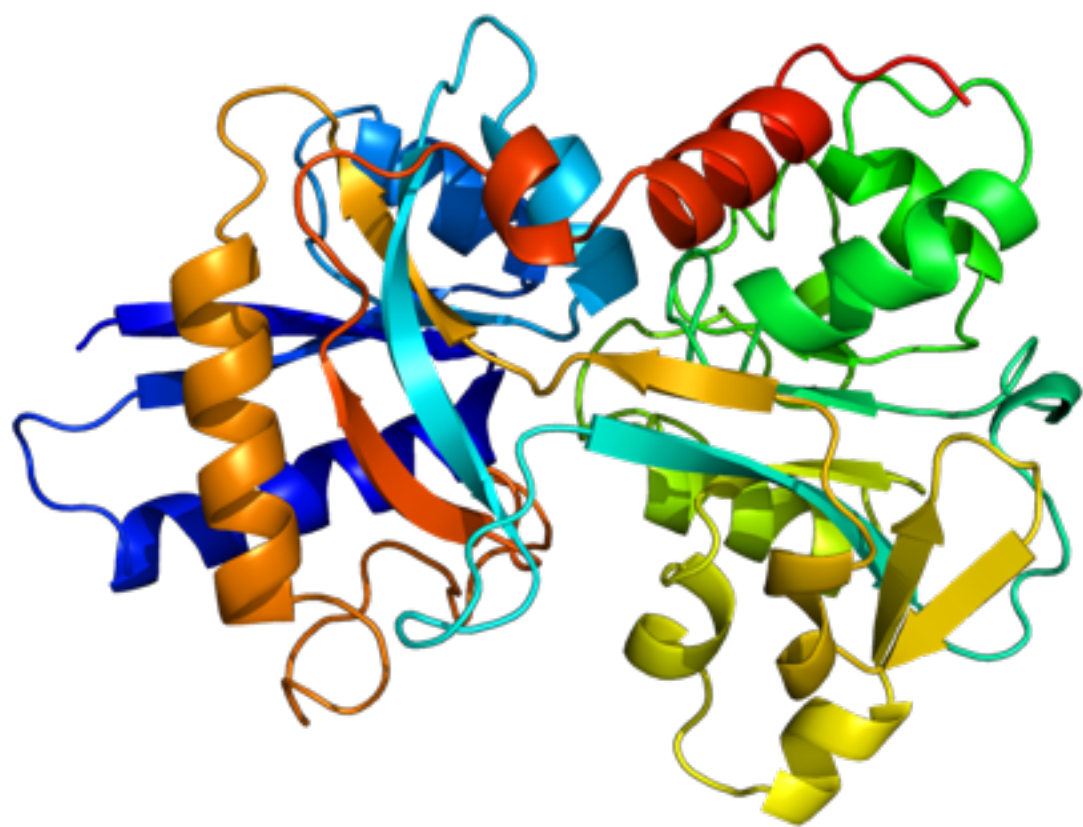




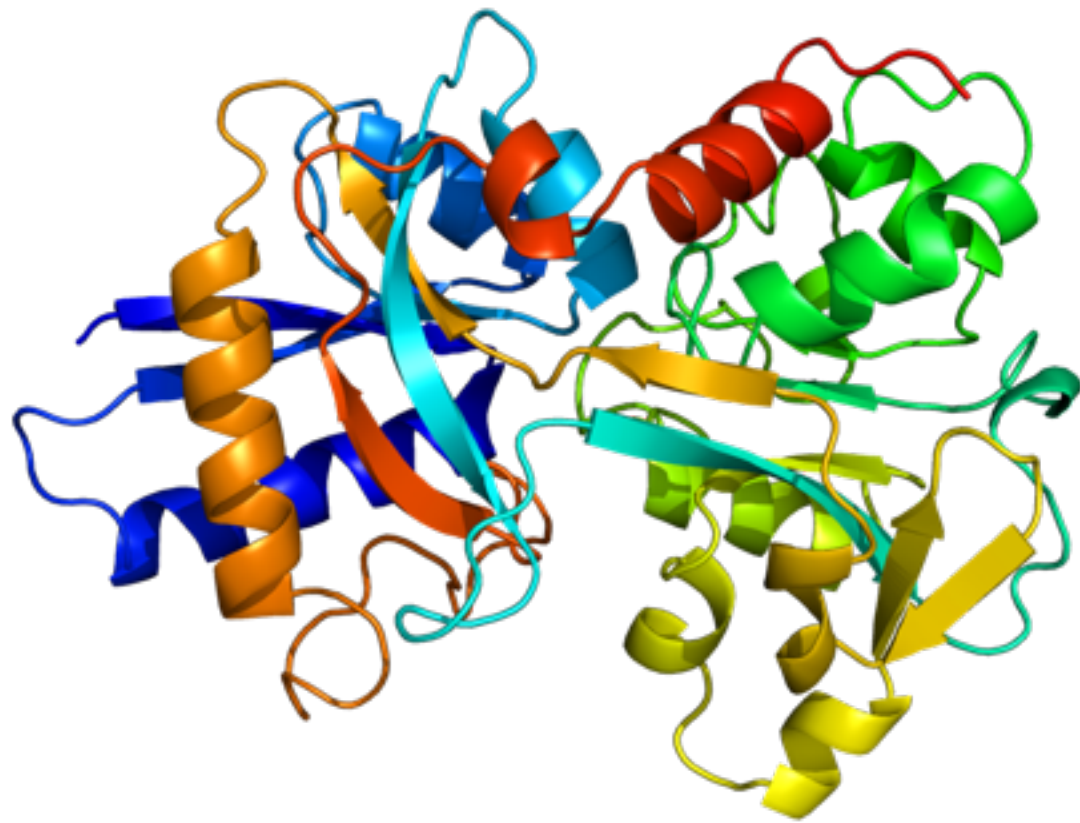
cornified layer  
of dead cells

stratified  
squamous  
epithelium





Transferrin



Transferrin

*binds to* →



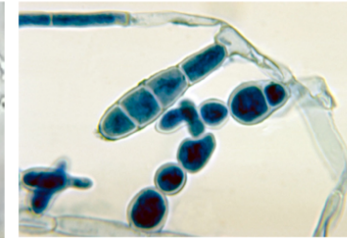
Iron



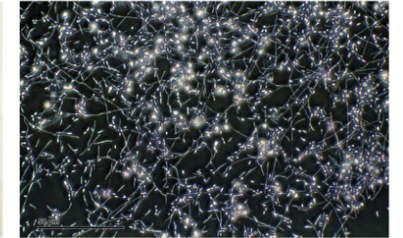
# DERMATOPHYTES



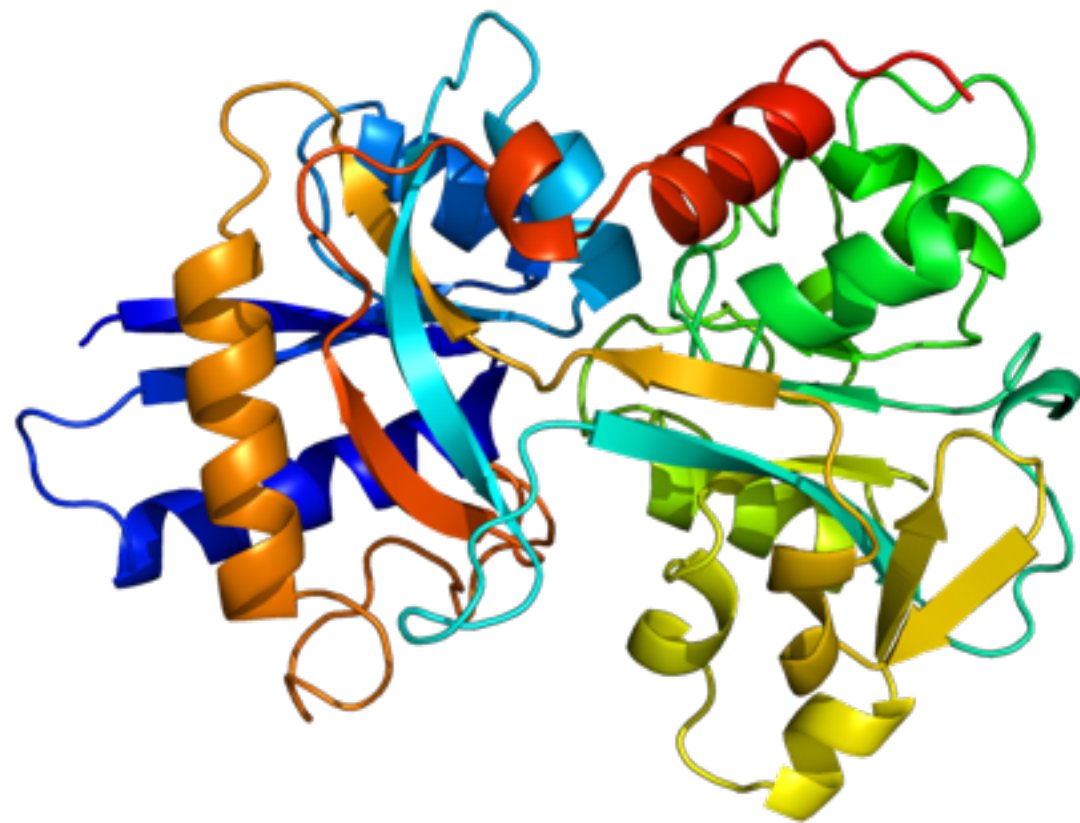
Trichophyton rubrum



Epidermophyton floccosum



Trichophyton interdigitale

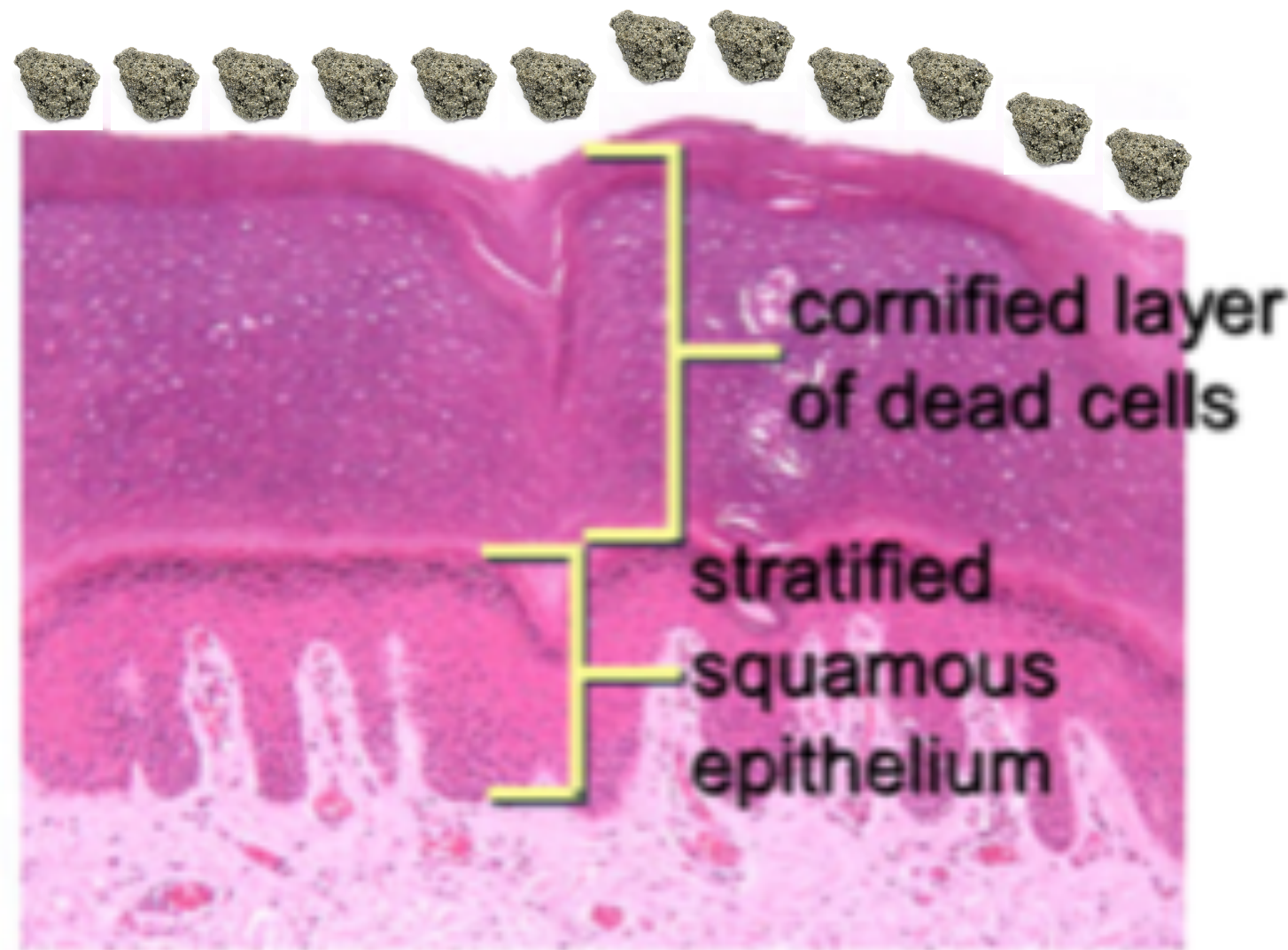


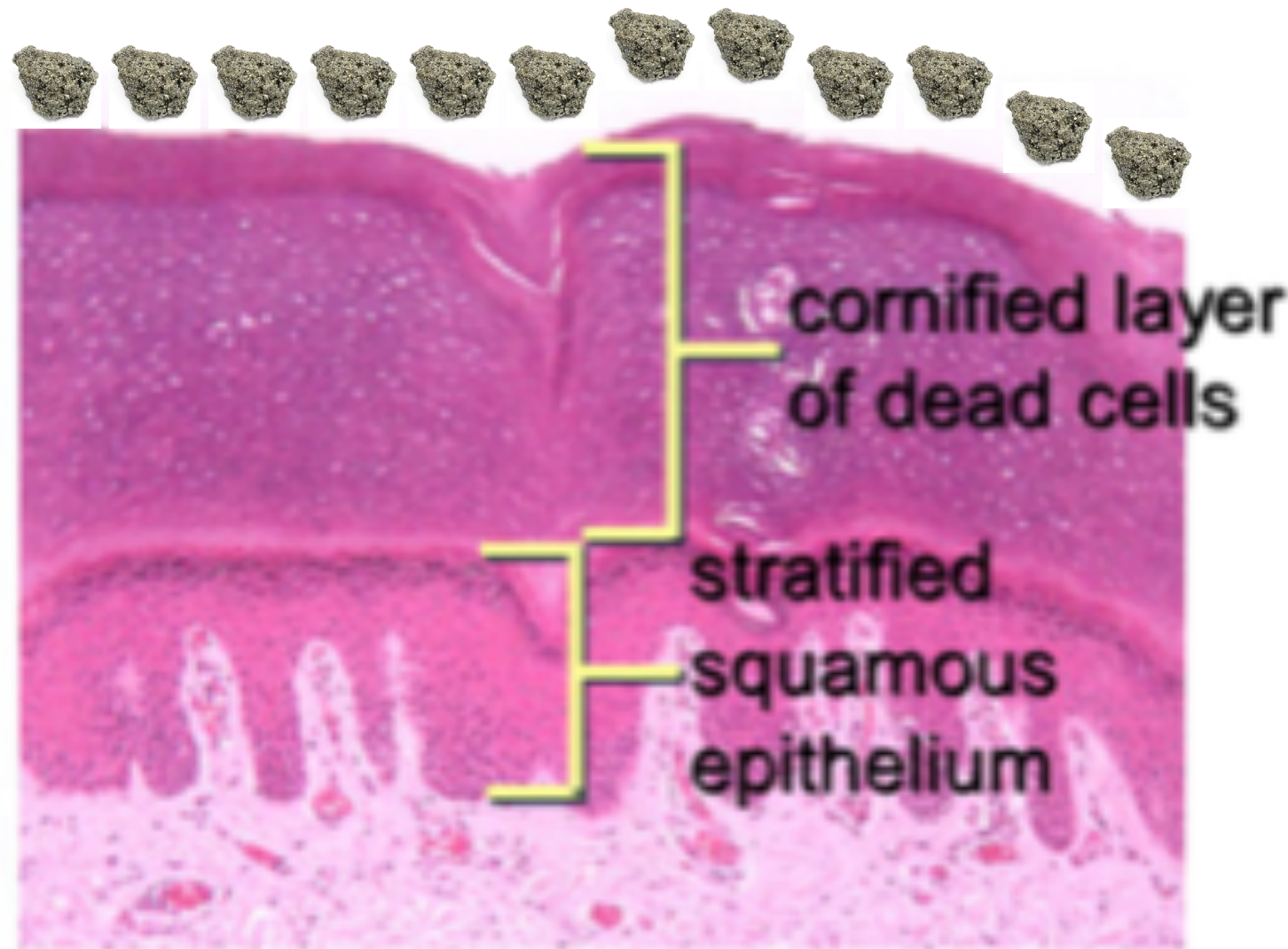
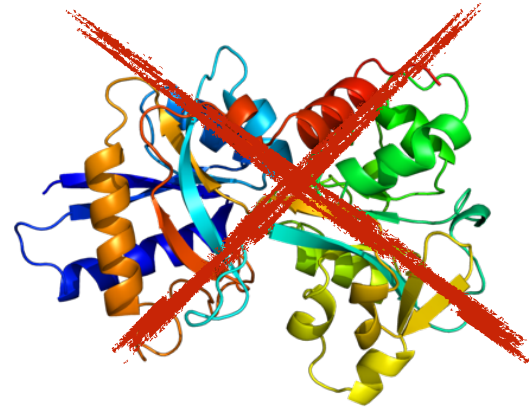
Transferrin

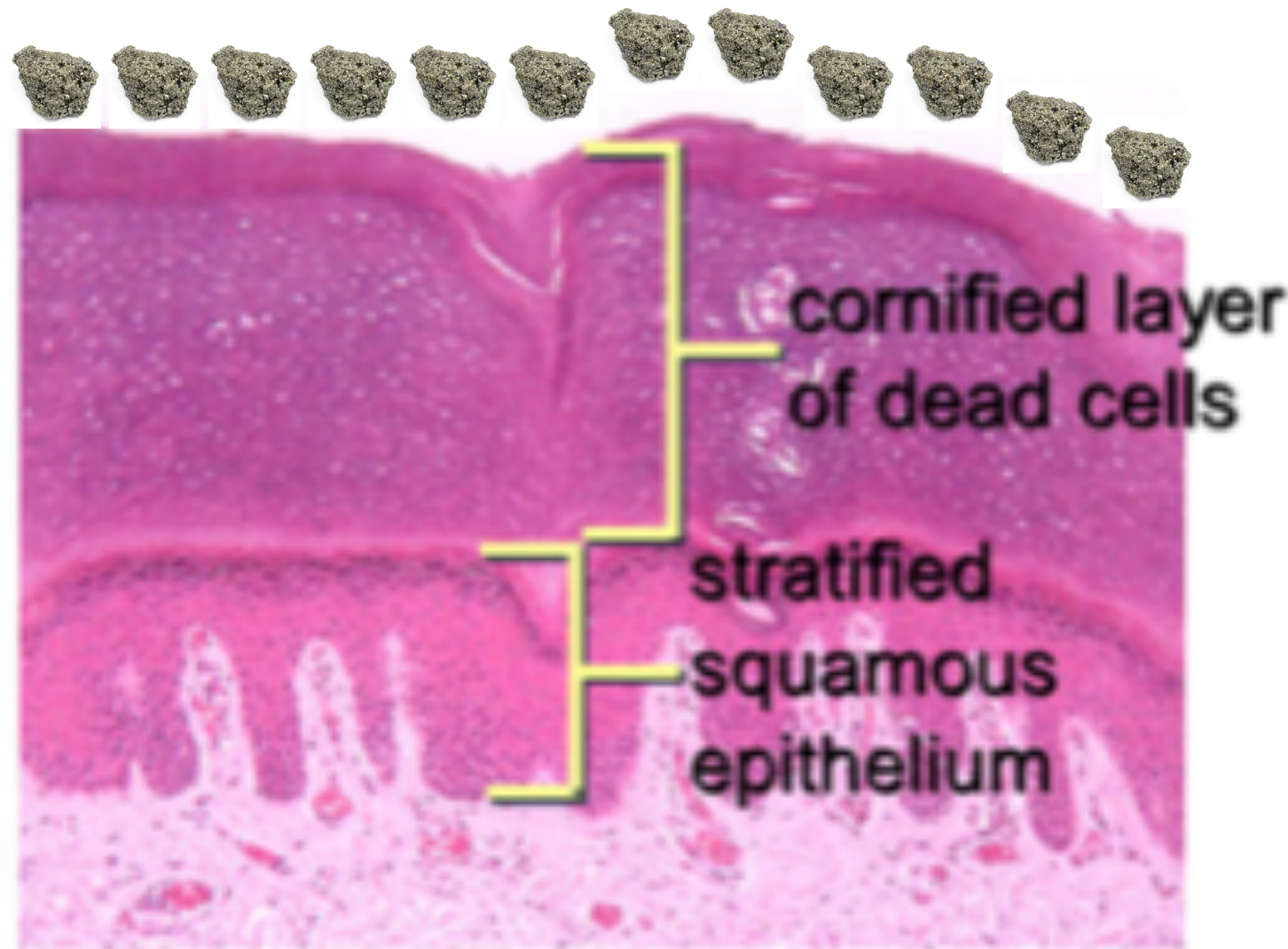
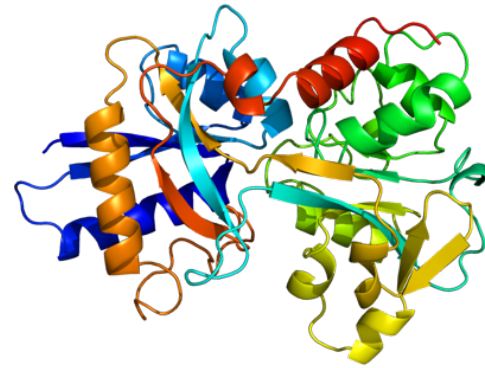


Iron



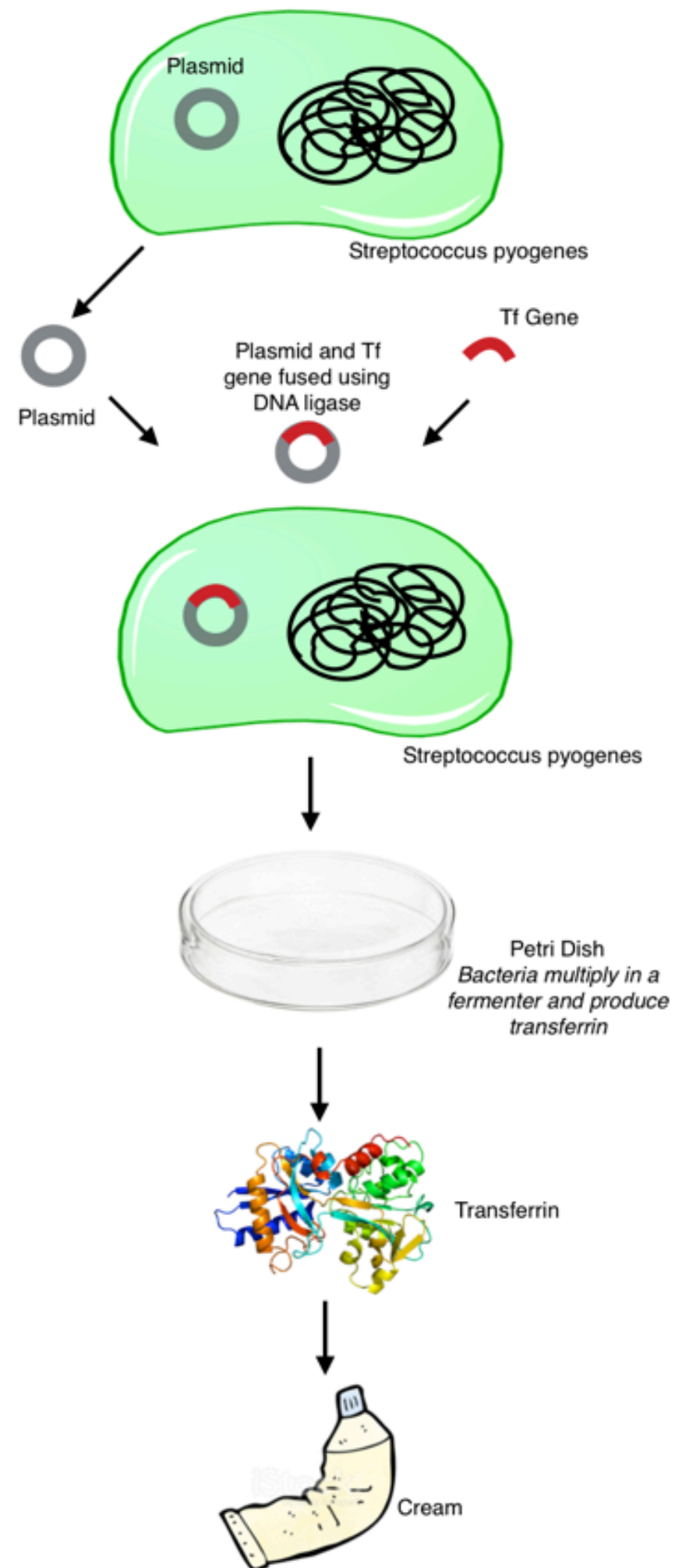




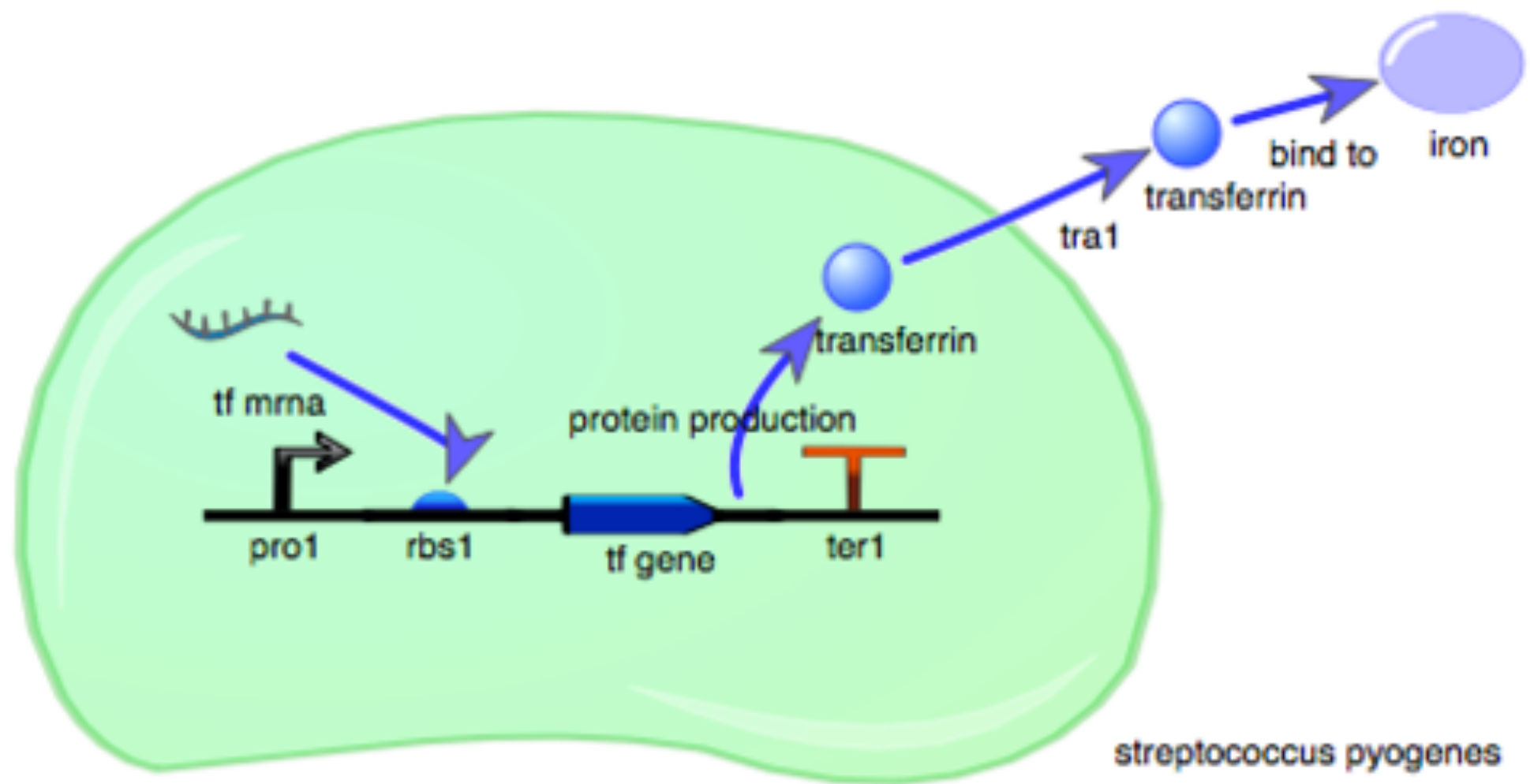




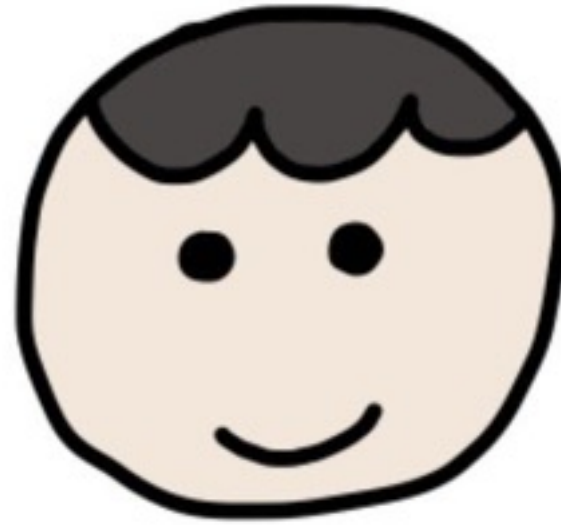
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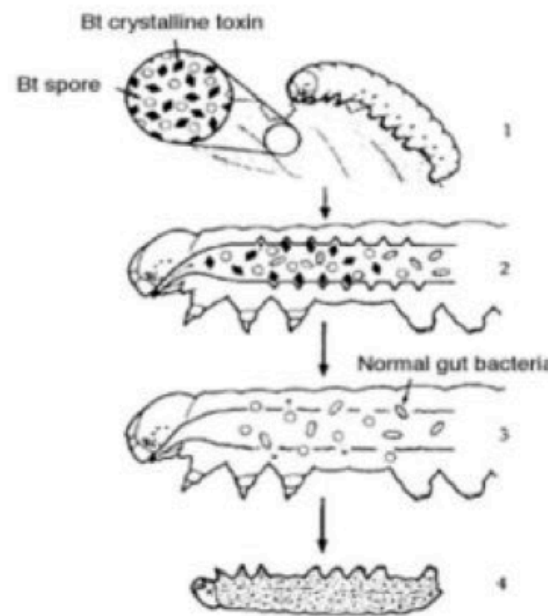




Transferrin	Iron	Tinea Pedis
1	1	0
1	0	0



1. Reduces Pain: Symptoms and Side Effects
2. Feasible: Technique Well Developed

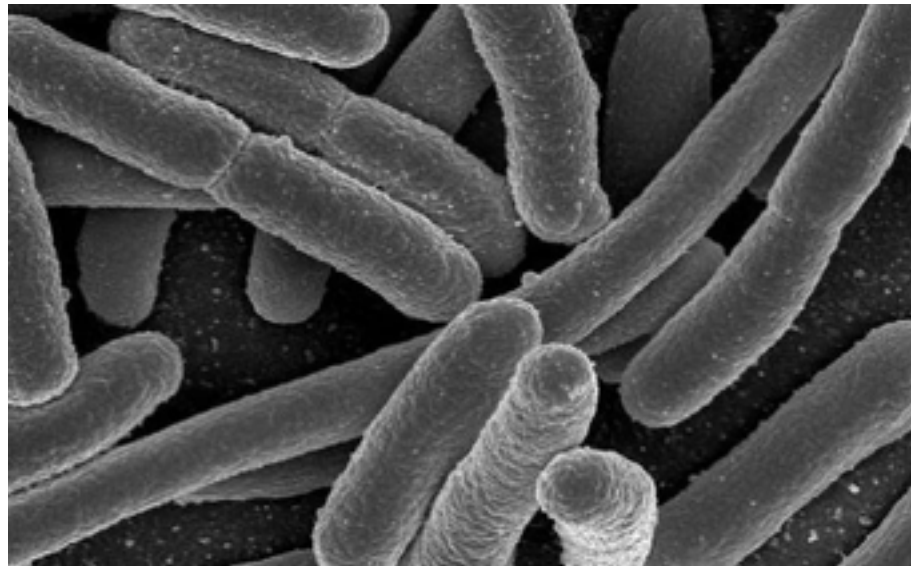


3. Few Side Effects Expected: No Transferrin Receptor + Dead Cells



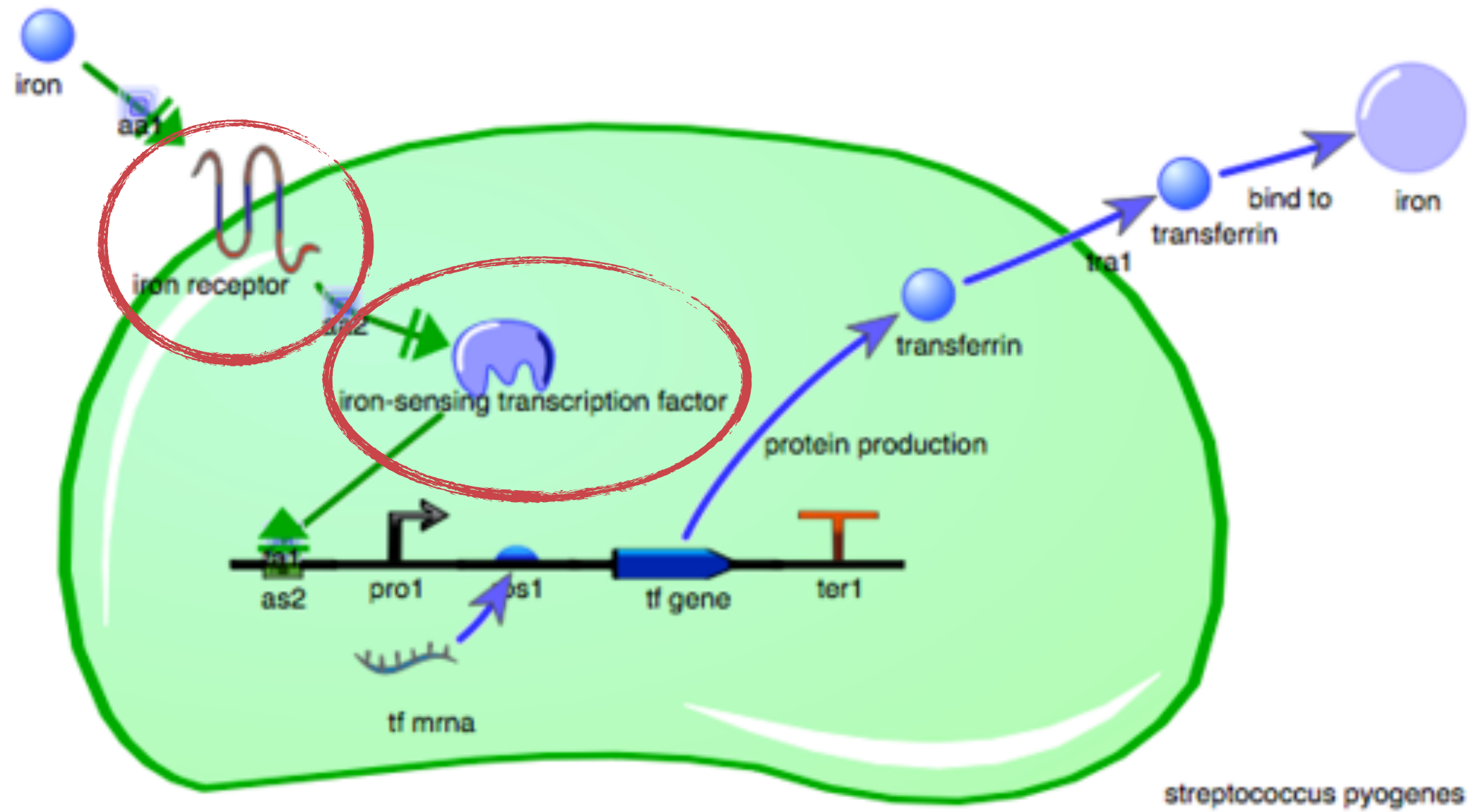
1. No Clinical Trials: Unexpected Side Effects Possible

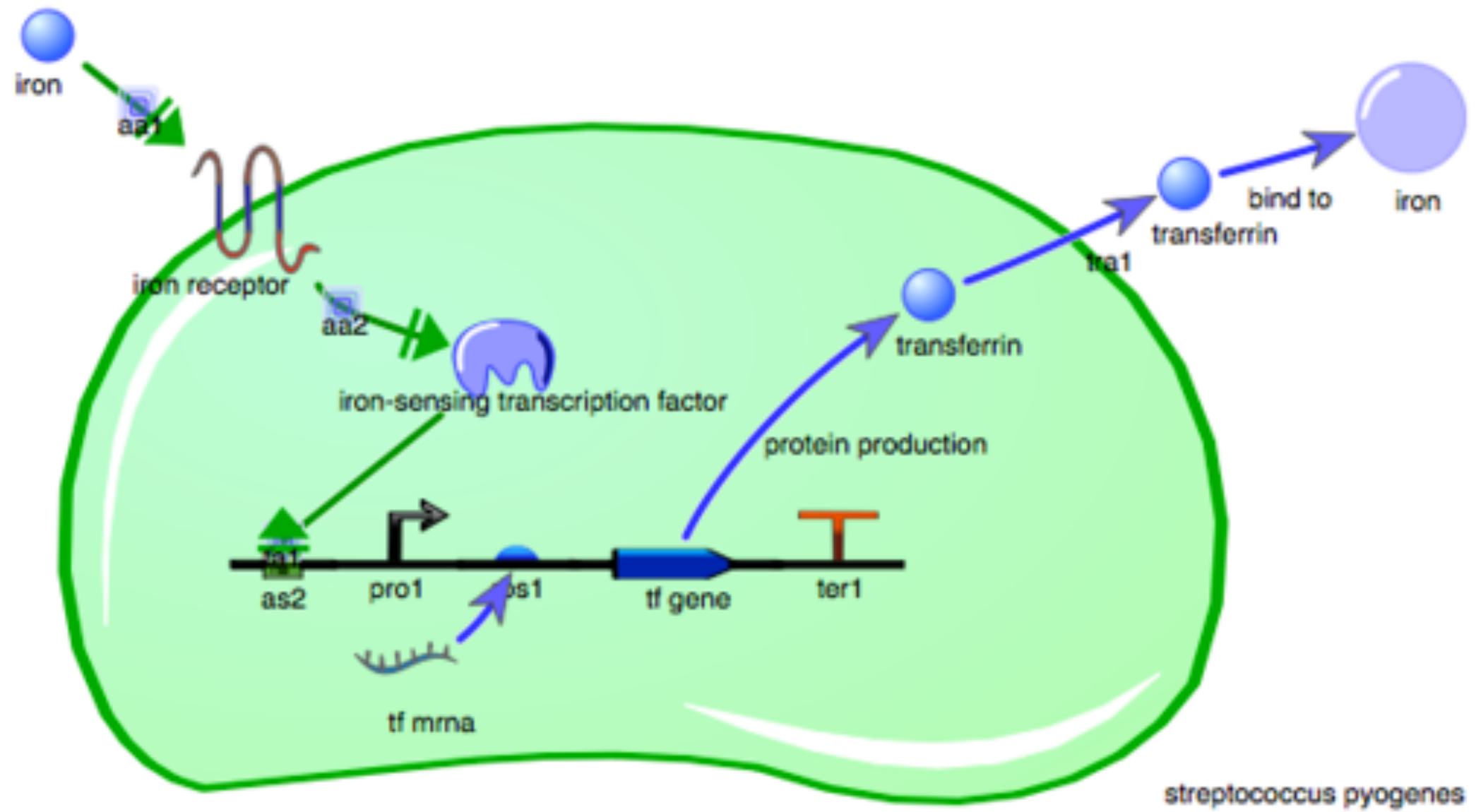
2. Fungal Evolution



3. Level of Transferrin Rubbed Hard to Control

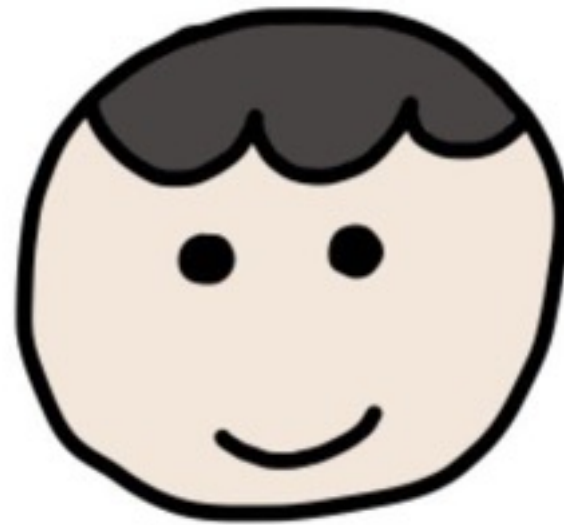






Iron	Transferrin	Tinea Pedis
1	1	0
0	0	0

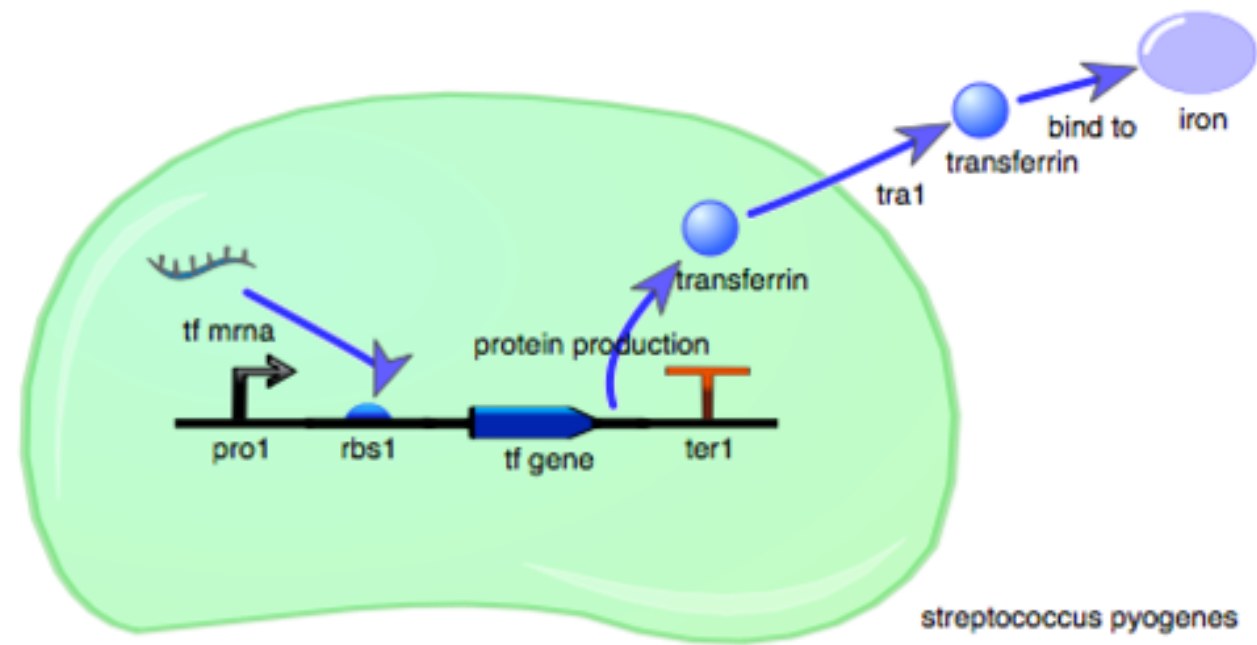




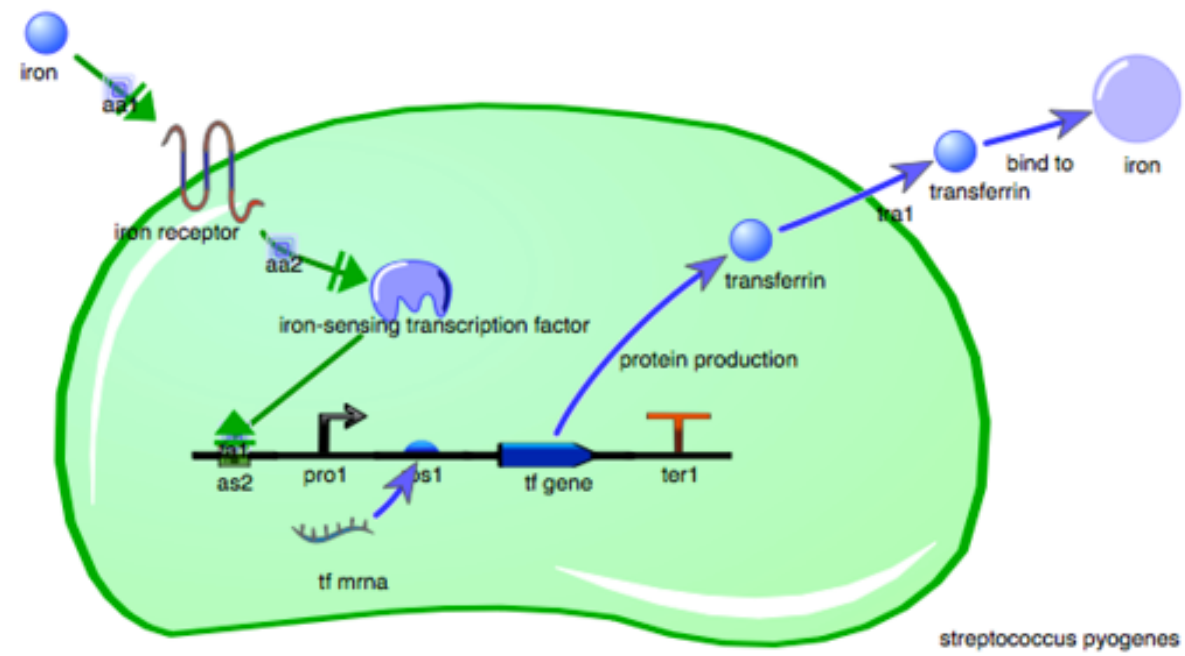
1. Reduces Pain: Symptoms and Side Effects
2. Few Side Effects Expected: No Transferrin Receptor + Dead Cells
3. Level of Usage Controlled✓



1. No Clinical Trials: Unexpected Side Effects Possible
2. Fungal Evolution
3. **Technology Not Well Developed: Higher Risk**



VS





4

Testing

1

Iron vs. Bacteria

2

Dermatophytes vs. Bacteria

3

Finding Transferrin-Iron Ratio (D1)

1. average iron content in different groups of people
2. amount of transferrin needed to bind those amounts of iron
3. give suggestions

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